

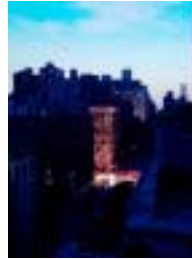
Combined Heat and Power— Decentralizing for Reliability and Income

Presented to
ASHE PDC

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by Dale Woodin, Deputy Executive Director
American Society of Healthcare Engineering

Blackout: power problems taxed electric grid
means trouble spreads quickly



We need a more
reliable energy
infrastructure

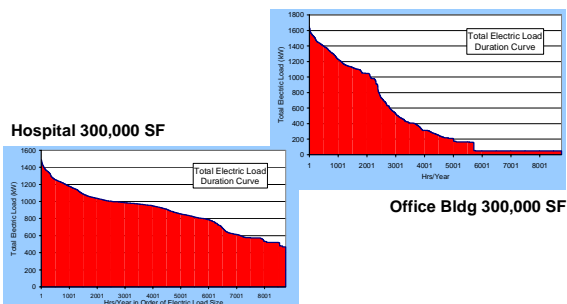
Blackout: Lessons Learned

- Hospitals designed to minimum stands
 - Hill Burton Act: modernize hospitals in disrepair due to depression & WWII
- Infection Control – negative & positive
- Cooling/dehumidification/ventilation
- Hospitals need integrated energy supply systems: Combined, Heat and Power
 - NFPA Codes can support on-site energy supply (see handout)

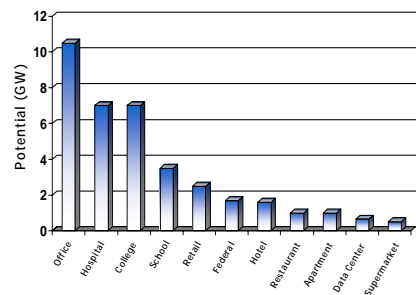
CHP in Hospitals Today: >200 existing sites,
with 470 MW, just 4% market penetration



Hospital Energy Consumption is More Constant than Other Commercial Loads

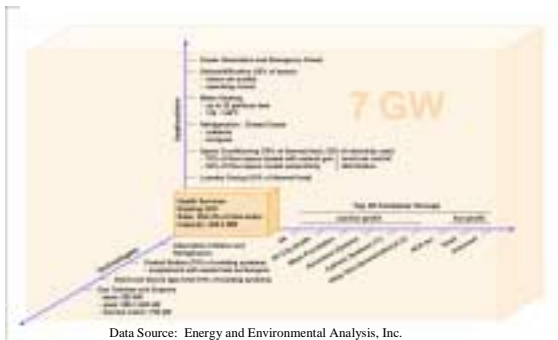


Hospitals: key CHP market segment

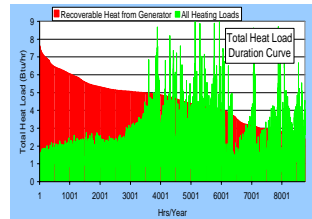


Data from Resource Dynamics, May 2002, Draft Cooling, Heating and Power for Buildings: A Market Assessment

Market Analysis: 7GW of CHP potential, CHP technology matches needs of for-profit/non-profit facilities



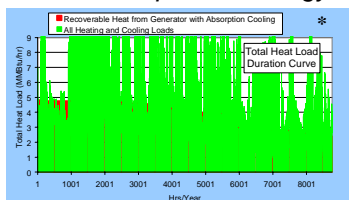
Hospital CHP: *Improve Power Quality and Reliability*



- Reduce momentary outages
- Provide backup electricity
- Provide backup cooling
- 42% of waste heat for space & water heating

Reference: William Ryan, Ph.D., UIC

Base-load Hospital CHP: *Optimize Energy Supply*



Reference:

* William Ryan, Ph.D., UIC

** Energy and Environmental Analysis

- Mix electric and absorption chillers to reduce boiler use
- Match heat rejected by generator with a thermal load
- 85% of the Waste Heat Can Be Used for Heating/Cooling
- Peak loads 500-1,400 kW**
- Base load 750kW**

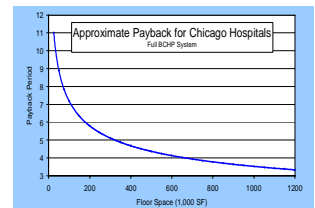
Develop Business Case for Chief Executives

Reduce energy costs:

- Cost savings associated improve energy efficiency and reducing momentary outages
- Keep revenue-generating diagnostic equipment operational
- Offer energy flexibility and reduce exposure to energy price volatility

Community Leadership:

- Improve environmental quality because of higher efficiency energy use



Reference: William Ryan, Ph.D., UIC

Active DE/CHP-ASHE Partnership

- Interview and build on experiences of 204 hospitals with CHP
- Analyze data from 150-300 EPA Energy Star Hospital Surveys for potential CHP applications.
- Evaluate AHA construction data base to identify hospitals that are expanding. Encourage capital improvement could include DE/CHP.

